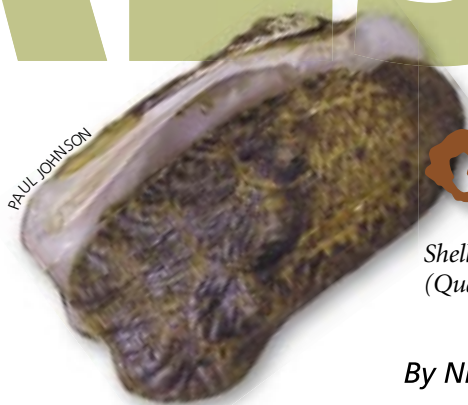


RESTORATION

Aquatic



Shell of freshwater mussel
(*Quadrula cylindrica*)

By Nick Nichols, Alabama Division of Wildlife and Freshwater Fisheries

With its variety of physiographic regions and aquatic habitats, Alabama has one of the most diverse populations of aquatic wildlife in North America. Historically, Alabama waters were home to over 170 species of freshwater snails, another 170-plus species of freshwater mussels and over 300 species of freshwater fishes. Due to this large number of distinct species, and for many of these animals, specialization to particular habitat requirements, many species have become extinct or extirpated in Alabama.

Over 40 species of freshwater snails and 25 species of freshwater mussels native to Alabama are now considered extinct, and others are extirpated. Many remaining aquatic mollusk populations have declined to the point where species are considered threatened or endangered. Over 50 species of freshwater mussels and 15 species of freshwater snails are listed as being of the "highest conservation concern" in Alabama. Only two species of freshwater fish native to Alabama are considered extinct, but nine additional species are now considered extirpated from Alabama waters, and 21 species are listed as being of the "highest conservation concern." In most cases, the loss or decline of these aquatic species can be attributed to the destruction and alteration of their aquatic habitats through the activities of man.

The successful development of culture techniques for Alabama's threatened aquatic species has the potential to greatly accelerate the reestablishment of viable populations of these species within their historic ranges as their critical aquatic habitats are restored. Reestablishment of robust, wild populations of now threatened species will also preempt the need for them to be listed as federally endangered. Equivalent successes with species that are already federally listed as threatened or endangered will greatly aid in their delisting.

Reintroduction of Species

During the past two decades, there have been a number of successful efforts to conserve threatened or endangered species and reintroduce them back into their native habitats by means of captive breeding and propagation programs. In the United States, the poster examples of these efforts have primarily involved the captive breeding of mammalian and avian species.

The California condor, North America's largest flying bird, was nearly extinct in 1987 when the entire remaining population of 22 individuals was brought into captivity from the wild for protection and captive breeding. Partnerships between federal and state wildlife agencies, private conservation organizations and other sponsors were formed to help save this species. By January of 2005, the total population for California condors had risen to over 240, with nearly half of these birds being captive-bred individuals that had been successfully reintroduced into the wild. A number of the captive-bred birds began courting and nesting activities once they had become acclimated in the wild. By 2004, four wild-hatched condor chicks had successfully been raised in their natural habitat by their captive-bred parents. When the slow maturation and reproductive rate of this bird is taken into consideration, this over ten-fold increase in population represents a notable accomplishment. In recent years, thousands of visitors to the Grand Canyon National Park in Arizona have been able to watch these birds soar again over that spectacular scenery that is a portion of their native habitat.

NG Wildlife

The red wolf and the Mexican subspecies of the gray wolf are two other high profile examples of animals that have begun a slow population recovery through captive breeding efforts and the limited reintroduction of captive-bred individuals back into parts of their former range. In Alabama, the reintroduction of the American bald eagle is another example of captive reared individuals of a species being successfully reintroduced back into its former range. A program initiated by the Wildlife and Freshwater Fisheries Division in the late 1980s was responsible for the release of 91 juvenile eagles that were reared in special cages at a number of locations within the state. Many of these young birds imprinted on their new homes; by 2004, over 50 nesting pairs of American bald eagles could be found in Alabama.

Aquatic Species Restoration

Although generally less well known, there have been a number of successful captive propagation programs for threatened aquatic animals in the United States. At various locations around the country, efforts are underway to conserve and reintroduce freshwater fishes, mussels and snails back into their former ranges and habitats. In the southwestern United States, a number of endangered fish species native to the Colorado River basin are being successfully maintained in captivity as part of a conservation effort aimed at eventually restoring stable populations of these species in their former habitats.

A program to conserve, propagate and reintroduce populations of the robust redhorse, a fish of the sucker family, has been ongoing since 1995 in the states of Georgia, South Carolina and North Carolina through a partnership between federal and state agencies, public utility companies and private conservation organizations. Through a similar partnership, there are also ongoing efforts to reintroduce the lake sturgeon, another fish species, to portions of the Tennessee and Coosa River basins in Tennessee and Georgia where this fish was once native.

In Alabama waters, the first efforts to reintroduce extirpated aquatic species into portions of their former ranges or augment

populations of federally listed species have already begun through the cooperative efforts of government agencies and private conservation organizations. In 2003, the first reintroduction release of the interrupted rocksnail, a species of freshwater snail that was once thought to be extinct, was undertaken in the Coosa River near Wetumpka, Alabama. This release utilized individuals propagated and reared in captivity. A second release of this snail at the site was made in 2004.

Other ongoing efforts to reintroduce or augment federally listed or threatened freshwater snail populations in Alabama waters include the captive propagation

Continued on Page 33 ►►

Reintroducing captive reared aquatic snails into Alabama waters

PAUL JOHNSON

RESTORING *Aquatic* Wildlife

Continued from Page 15 ►►

or translocation of the plicate rocksnail, Anthony's riversnail and the flat pebble-snail. Similar efforts with threatened freshwater mussel species include work with the Tennessee heelsplitter, birdwing pearl mussel, dromedary pearl mussel, pink lilliput, oyster mussel, Alabama lampshell and the finereyed lampmussel. At this time, the only effort to reintroduce a federally listed or threatened fish species in Alabama waters has been the reintroduction of the boulder darter into Shoal Creek in north Alabama following the restoration of its former habitat there.

New Facility

Ongoing efforts to restore aquatic habitats within Alabama by modification of regulated flow regimes below dams and through stream restoration projects will result in an increased number of opportunities to restore populations of threatened aquatic species by augmentation and reintroduction. As the propagation and rearing techniques for culturing these threatened aquatic species are further developed and refined, the primary limiting factor in the expansion of these programs in Alabama will be the availability of culture facilities and personnel dedicated to this effort. A program was needed within Alabama to establish a facility dedicated to the conservation and propagation of endangered aquatic species for the end purpose of restoring their populations in the wild.

The former Claude Harris National Aquaculture Research Center was located near Marion, Alabama, and was last operated by the Biological Resources Division of the U.S. Geological Survey before being closed in 1995. In 1998, the U.S. Department of the Interior was authorized by Congress to convey this property to the State of Alabama Department of Conservation and Natural Resources. This property is located adjacent to the Marion State Fish Hatchery, and is approximately two miles from the Cahaba River, where it flows from the fall line hills into the black belt prairie physiographic region of Alabama. This facility is comprised of approximately 30 acres of earthen ponds, two "wet" laboratories, a combination office and laboratory building, a fish holding house and other support facilities.

A portion of this property has been identified as a suitable facility for the propagation of aquatic species of conserva-

tion concern. The combination office and lab building is approximately 4,200 square feet in size, with five "dry" bench labs, office spaces, rest rooms, a conference room and a dark room. A larger wet lab building encloses approximately 6,250 square feet of area at ground level, with over 3,250 square feet of this area being configured as a single wet lab for use as a tank room. It is equipped with water and air supply systems and a floor drainage system.

The remaining ground level area of this building is comprised of office space, a dry bench lab, a necropsy lab and utility spaces. The primary water supplies for this lab are from artesian wells and surface water from two nine-acre earthen ponds. A smaller wet lab encloses about 3,300 square feet of floor area, of which approximately 2,000 square feet of this floor space has been set up as two separate tank rooms provided with water, air and drain lines. The water supply for this building is an artesian well. Although these three structures and their support facilities require some renovation and repair, it was determined that they could be readily adapted to a new purpose.

In 2004, the Alabama Division of Wildlife and Freshwater Fisheries submitted a proposal for funding through the Federal State Wildlife Grants Program. The objective of this grant was to establish a facility dedicated to the captive propagation of Alabama's aquatic species of highest conservation need with the goal of developing propagation programs to enhance and assist efforts to reintroduce extirpated species back into their historic habitats and ranges. This grant was approved by the U.S. Fish and Wildlife Service and it now provides nearly \$1 million of federal funding for development and operational costs. Additional state funding and contributions from other non-federal partners will provide for an overall budget of nearly \$2 million for the initial five-year period of the program.

Repairs and renovations to the selected buildings and support facilities of the former federal facility will be undertaken.



NICK NICHOLS

View of the main wet lab in the former Claude Harris National Aquaculture Research Center

The two wet labs will then be outfitted with the specialized aquaria, tanks and water treatment systems that will be needed for the culture of those freshwater mussel, snail and fish species that are selected for propagation. Most importantly, a drain-water filtration system will also be designed and installed to prevent the escape of cultured species that are not native to the facility's location in the Cahaba River basin.

A staff of biologists, technicians and support personnel will be hired to operate and maintain the facility, develop culture techniques and propagate the aquatic species that are identified as candidates for reintroduction and population augmentation in the wild. Transportation and maintenance equipment items to support the program's operations and additional technical support equipment, materials and supplies will be acquired as culture and program needs are further identified. On-site residences for at least two of the facility's staff will also be provided to enhance the security and monitoring of the facility during periods outside of normal working hours.

The short-term goals of this project are to have many of the repair and renovation jobs underway, or complete, by the end of summer 2005, and have core staff positions filled in time to begin work with candidate aquatic species by December 2005. The long-term goal for this program is to support the efforts of the Division of Wildlife and Freshwater Fisheries and its partners to conserve and restore the rich heritage of aquatic wildlife native to Alabama.

For further information on this exciting new program, you may contact the Alabama Division of Wildlife and Freshwater Fisheries, Fisheries Section at (334) 242-3471. 